KENTUCKY EDUCATION NETWORK
KENTUCKY EDUCATION CABINET

KEN Applications Subcommittee
Work Group on Data Transfer
Final Report - September 10, 2007

Charge:

The Data Transfer workgroup will identify the requirements for secure and reliable data transfer capability necessary to impact teaching and learning within the Commonwealth. Once the requirements are collected, the workgroup will examine possible options that will address requirements for that data as the KEN network evolves.

Scope:

The Data Transfer workgroup will examine industry standards, best practice data transfer protocols, types of encryption and other security issues, possible future needs for data, and any corresponding products that may address the requirements. The workgroup will make recommendations for the future use of Data Transfer in a secure and reliable manner.

Timeline:

July 18, 2007 – Mid-project progress report to the KEN Applications Subcommittee
September 1, 2007 - Recommendations due to the Subcommittee

Work Group Members:

COT – Teri Ogden*
CPE – Stuart Johnston
Education – Liz Stafford*
EPSB – Scott Smith
KCTCS –Rick Chlopan
KDE – Lee Muncy*, Robert Grissom, Martin Herbener

Where We Are in the Use of This Application:

1. Each of the KEN partners use various types of data transfer methods depending on the need/types/sizes of data and all follow best practices for the transfer of that data and realize the mission criticality of that data in their respective enterprises. Most of the partners believe in the phrase “Data is Data”. Data may be of different types, sizes, and use differing means of transport, security, and encryption, but in itself is just an object that can follow the same type of standards, practices, and polices no matter the carrier of that data.

2. Best practices for Data Transfer include using:
   - HTTP
   - FTP over HTTP
   - FTP over TCP
   - FTPS (for mainframe file transfer)
   - HTTPS (secure transport)
   - NNTP
   - MMS

- TSPard
- ICAP

And the types of security methods/modes used include;

- IPSec,
- SSL,
- SSH

3. An example of how one of the KEN partners have included secure and reliable Data Transfer planning into their current and future plans is in the "2007-2012 Education Technology Master Plan" for KDE. As part of the creation of the plan, surveys were taken to help identify areas where educational technology was helpful and areas where there could be some improvement. Some of the findings included the following on Addressing Technology Gaps, Data-Driven Decision-Making for Teachers and Administrators and in the Role of Electronic Information in Curriculum and Instruction Decision-Making:

Page 13 – "2007-2012 Education Technology Master Plan"

Address Technology Gaps

The review of the current education technology situation revealed gaps in core areas related to the technology solutions and management framework that must be addressed. Reducing these gaps will leverage the strategic educational initiatives for enterprise-wide benefits, optimize the costs of implementing the solutions by offering the opportunity for re-use, and eliminate redundant and potentially conflicting efforts. These core areas include:

- application data standards
- solutions delivery methodology and capability
- application portfolio management
- education application support and training
- portal strategy and management
- data warehouse and business intelligence
- instructional and assessment applications
- document and content management
- shared enterprise, local and agency applications
- shared utilities, hardware, network and computing infrastructure management

Page 24 – "2007-2012 Education Technology Master Plan"

Data-Driven Decision-Making for Teachers and Administrators

In the Master Plan, recognizing data as a strategic educational asset remains a top priority. As demonstrated in previous plans, KDE initially recognized this fact early in the life of the KETS program. The 1992 Master Plan called for a decision support system to assist the management and evaluation of the public education system in Kentucky. The Statewide Reporting and Information Management (SRIM) System, with an enterprise data model depicting the data collected and shared within the public education system, was constructed. The 2001 Master Plan established a vision for an enterprise database that came to be known as Max.

Today, the demand for access to data to improve decision-making and instruction at the federal, state and local levels continues. The principles of data management in the P-12 educational environment, originally introduced in previous versions of the Master Plan, remain pertinent and applicable today.

For emphasis and reiteration, these principles are intentionally repeated:

- Data is a strategic enterprise asset and will be managed as such.
- Enterprise-wide processes will be developed to move data collection and validation to the source and reduce duplication and redundancy.
- Data will be moved and made available electronically.
- Stewardship and ownership of the various data will be explicitly identified.
- Data owners will establish procedures and processes that articulate the circumstances under which data will be collected, validated or purged.
- Common data definitions will be established as standards.
- KDE will differentiate data from "records" in the context of public records management. The department will review and update its procedures for managing public records in electronic format.
- Data reporting to support compliance and assurance with state and federal program requirements will be consolidated.
- Security and authentication policies will be associated with each aspect of the enterprise data model.
- Privacy will be protected.
- Policy-worthy information will be available for decision support.
- The decision support needs of the Kentucky Board of Education and others will continue to be analyzed. Priority will be placed on supporting the information requirements of the board within the context of current board priorities.
- Standards will be defined for data collection and end-user reporting tools.
- Data from disparate systems will be combined in a common repository or data warehouse.
- Those who provide data to the enterprise data management system will be able to use the data management system for their decision support needs.

KDE will continue the collection and reporting of student and school management information from the schools. The role of standards including the School Interoperability Framework (SIF) and SIF Zone Integration Services (ZIS) at the vendor provider, school, district office, state and federal levels will be investigated.

Page 74 – "Appendix B - 2007-2012 Education Technology Master Plan"

Role of Electronic Information in Curriculum and Instruction Decision-Making

Technology deployed for curriculum and instructional decision-making solutions is a growth area. As with many other industry and service organizations, technology was first deployed to administrative functions, such as human resources and finance. Today, as a result of regulatory changes driving accountability and reporting, increasing use of standards-based instructional requirements, student information and instructional systems are more central than ever to school districts.

- Data reporting demands of NCLB and the drive for accountability in education has compelled schools to address this area.
- The grouping includes student information systems, instructional or curriculum management systems and learning content and library management systems.
- As with other enterprise-wide solutions, the trend is towards integration of these separate but related areas.
- Interoperability and ability to share information are keys. Two competing interoperability standards are likely to coexist for some time because they meet different needs.
  - The Schools Interoperability Framework (SIF) is the data sharing standard for schools. SIF products and a Zone Integration Server can tie together product standardized data services within a district (e.g., SIS data system with cafeteria data system with library management data system).
  - Open Database Connectivity (ODBC) governs data access from a variety of database management systems and is an industry-wide standard that does not have an education-specific focus.

4. The members of the Data Transfer workgroup recognize that the goals of this workgroup do overlap in various ways with the goals and objectives of most, if not all, of the KEN IT Applications Workgroups. This may help to better organize what is being done as a whole and to help merge different workgroup requests for applications funding.

5. The Commonwealth Office of Technology has the responsibility for leading and enacting standards for state agencies including those in the KEN partnership. They have created the Kentucky Enterprise Data Structure Group. It has charted its' strategic vision and this report can be found at: http://technology.ky.gov/policies/architecture_and_stds.htm

Where We Want to Go in the Use of This Application:

In our discussions, the workgroup's vision of where we want to go in the use of data transfer is to articulate/ensure that the partners in the KEN project will be able to:

- Use various types of data as needed in a secure and reliable manner,
- Be able to use real-time transactional data as needed,
- Have the needed amounts of bandwidth necessary for secure and reliable data transfer,
- Have the proper type of security for the size and type of data,
- Have proper types of encryption for the size and type of date,
- Have the ability to create "trusted" relationships with partners – that they are able to "trust" that original data is reliable,
- Make the process(es) as seem-less and easy to use (keeping security and encryption needs in mind) as possible for those using data in all areas of education – students, teachers, administrators,
- Encourage the thoughtful and logical adoption of newer technology as needed,
- Be able to provide decision makers with the appropriate level of data whenever and wherever it is needed,
- Be able to follow Federal and state regulations regarding protection of their data.

The workgroup also reviewed that it is sometimes easier for those on the technical end of the KEN network to understand what and how data is being moved. What might be needed to help grow the process for this application is a better understanding by those who use the data in an administrative and educational environment on a regular basis on what can be done when the above objectives are in place? How can all areas within the P-20 environment make better use of tools and applications on the KEN network for data transfer?

This workgroup discussed the possibility of recommending a pilot project for the purpose of demonstrating the uses of transferring large amounts of data in a secure and reliable environment and being able to measure those metrics such as speed, size, and types of data.

This pilot project may be part of an existing program/project within the KEN partner realm or be created for this purpose. Possibilities include the KIDS project or the Florida Orange Grove LOR.

How Are We Going to Get There?

The Data Transfer workgroup recommends the following:

1. It is the recommendation of this workgroup that as statewide standards evolve, that the KEN partners should be included in any type of statewide standards workgroup or board to make sure that KEN partner interests are vetted and taken into consideration.
2. It is the recommendation of this workgroup that a request be made that there be funding requested to provide statewide or regional workshops. The purpose of these workshops/training sessions will include detailing possible future uses of the KEN network to those using the KEN network and other interested parties. In particular, how the expanded network can facilitate larger data transfers in a secure and reliable method. This training should not only include those technical areas but in the operations and administrative area as well for the best overall effect. The same could be done by participating in various meetings and conferences done by the KEN partners in the Education cabinet. An example of this would include KDE's Kentucky Teaching and Learning Conference.
3. It is the recommendation of this workgroup that the KEN IT Application Subcommittee participate or initiate a pilot project for the purpose of monitoring the transfer of various types of data between trusted partners within and without the KEN partnership or authorizing a central group to gather that information from the various KEN partners. This monitoring will help in establishing benchmarks in terms of speed, bandwidth utilization, and the effects of various types of encryption on the data being moved on all aspects/areas within the KEN network from the KIH2 provider level to the district user level. Reports generated from this monitoring could be provided as needed to better help plan utilization of the network, establishment of enterprise level Service Level Agreements (SLA), as well as assist in the organized evolution of the KEN network as needed in the future. This recommendation may entail the purchase of services or software to capture and report that information to that group for analysis.

Impact on Teaching and Learning:

It is readily understood by all of the KEN partners that they will need to be able to move larger amounts of data to entities, both internal to the KEN partnership and those outside of the partnership. This data will be of various types, sizes, and needing certain levels of encryption/protection.

This use of this various types of data will have a real-life impact on the ability of the KEN partners to interoperate, test and assess, create usable data warehousing, produce reporting mechanisms for internal and external clients, and be able to deliver the needed data resources for students, parents, educators, agencies, and other vested interests to determine future needs in the teaching and learning environment.